JOINT STRIKE FIGHTER BRIEFING

Autonomic Logistics

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VISION

BE THE MODEL ACQUISITION PROGRAM FOR JOINT SERVICE AND INTERNATIONAL COOPERATION

DEVELOP AND PRODUCE AN AFFORDABLE NEXT GENERATION STRIKE FIGHTER WEAPON SYSTEM AND SUSTAIN IT WORLDWIDE

SERVICE NEEDS

- **USN (480)**
  - Multi-role, stealthy strike fighter to complement the F/A-18E/F

- **USAF (1763)**
  - Multi-role (primary air-to-ground) fighter to replace the F-16 and A-10 and to complement the F-22

- **USMC (609)**
  - Multi-role, short takeoff, vertical landing strike fighter to replace the AV-8B and F/A-18C/D

- **UK Royal Navy and Royal Air Force (150)**
  - Supersonic STOVL replacement for the Sea Harrier and GR-7

EMD INTERNATIONAL PARTICIPATION

- **Cooperative Partner**

  Level I - UK Memorandum of Understanding (MOU) Signed 17 Jan 2001

- **On-Going Negotiations**

  Level II - Italy

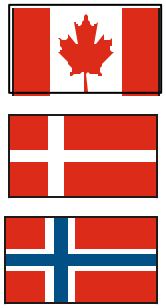
  Netherlands

  Turkey

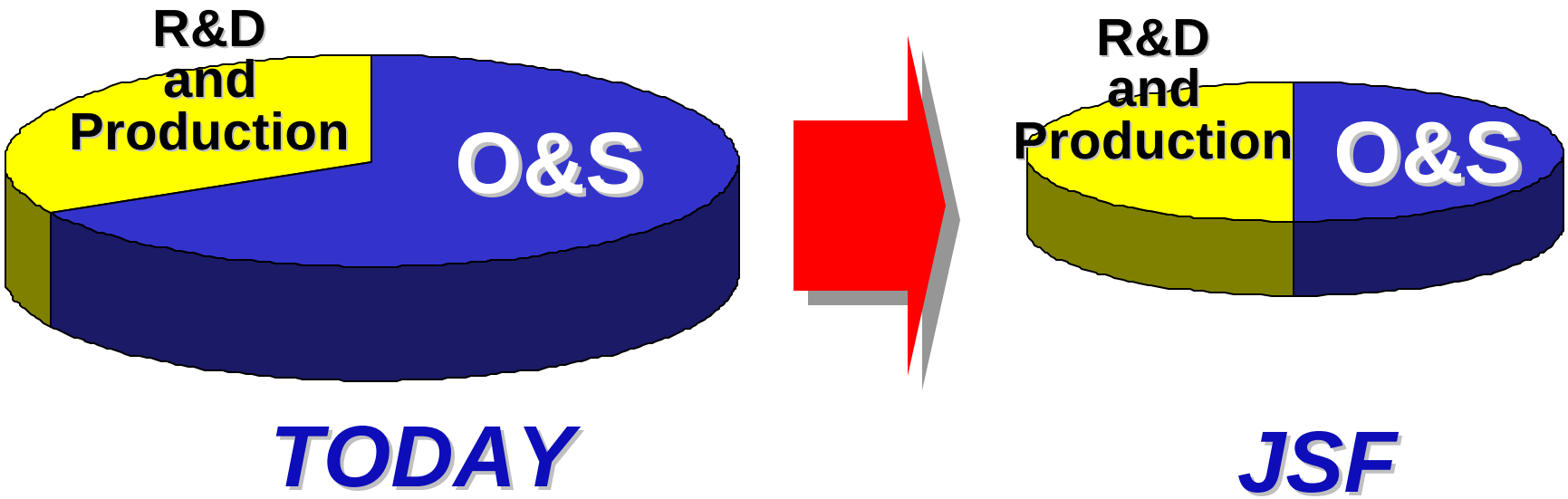
  Level III - Canada

  Denmark

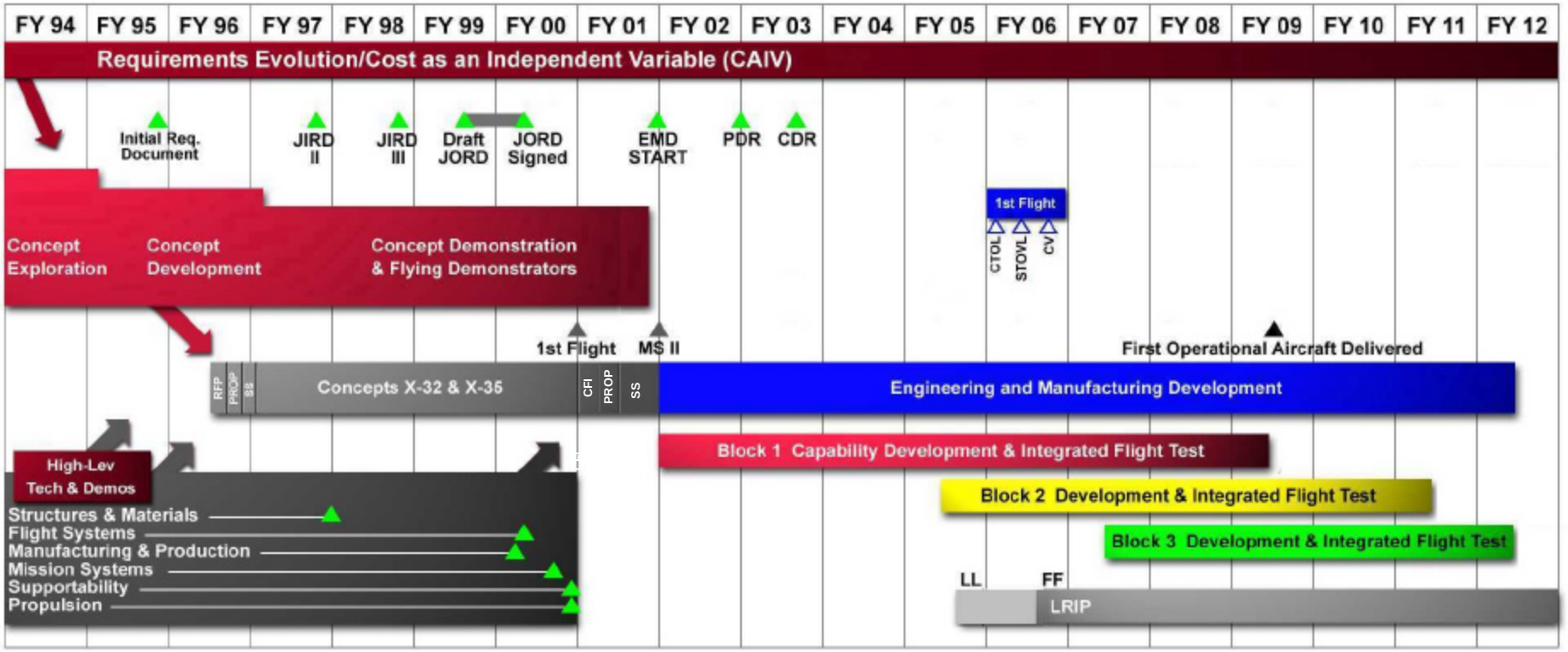
  Norway



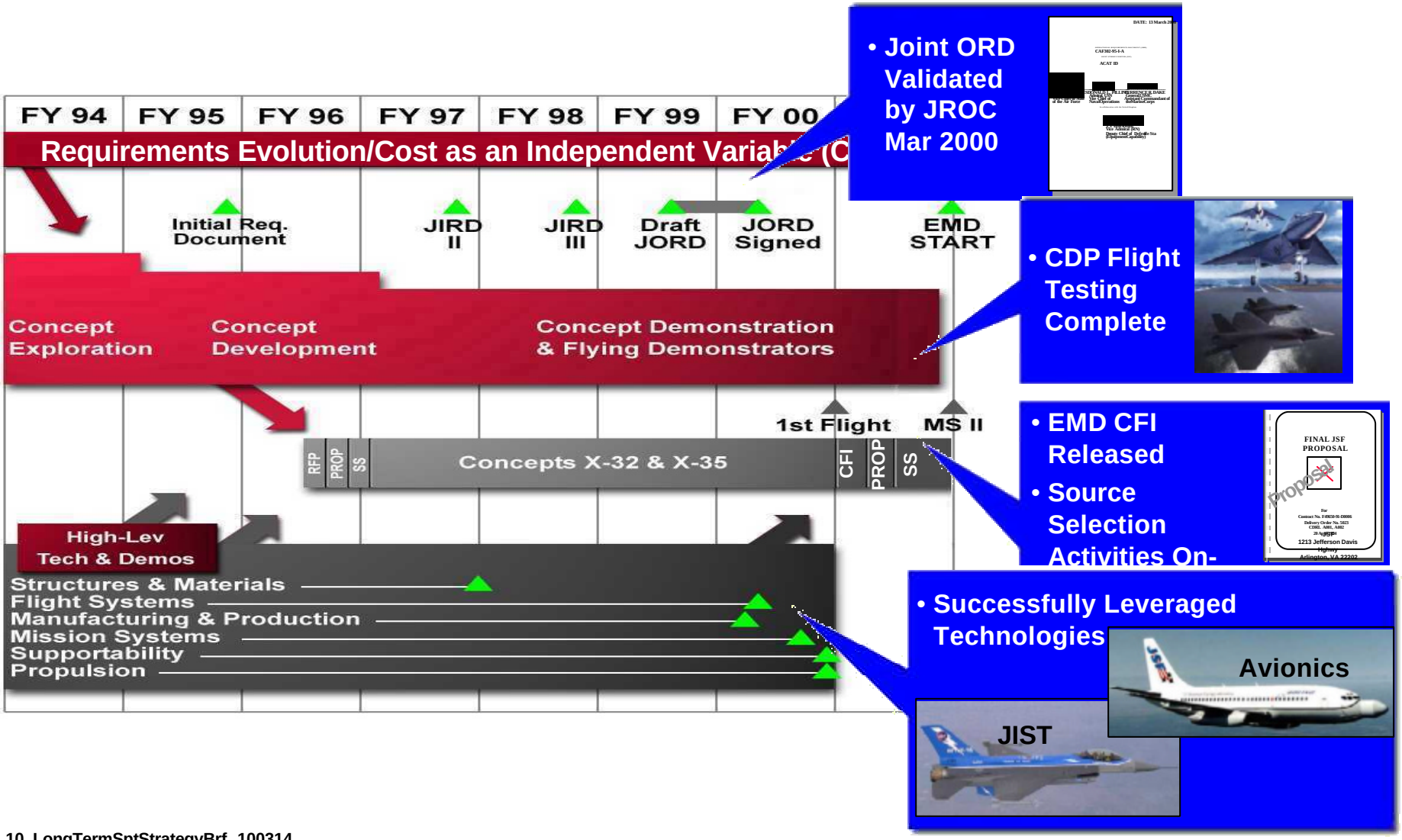
AFFORDABILITY CHALLENGE



JSF PROGRAM SCHEDULE



JSF CONCEPT DEMONSTRATION PHASE



BOEING X-32B (USMC / UK)

FLIGHT TEST:

- First Flight on 29 Mar 2001
- 78 Flights, 43.3 Hours
- Flight Test Completed, 28 Jul 2001

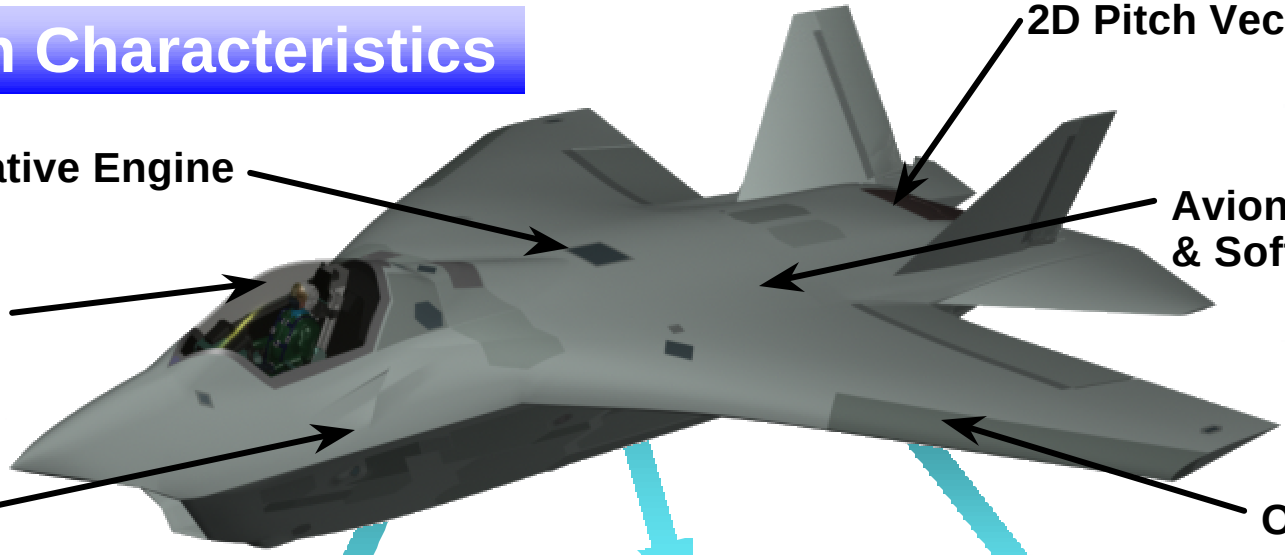
SIGNIFICANT ACCOMPLISHMENTS:

- First STOVL Flights (at altitude) 13 Apr 2001
- X-32B Arrived at NAS, Patuxent River on 11 May 2001, Where it is Conducting the STOVL Portion of the Flight Test Program
- Completed First Hover on 24 Jun 2001 Including Turns and Translation in Hover
- Completed Vertical Landings 27 Jun 2001
- Completed Demonstrated Objectives
- Completed Noise Survey

MULTI-SERVICE PREFERRED DESIGN CONCEPT

JOINT STRIKE FIGHTER JSF BOEING

Common Characteristics



Service Tailoring

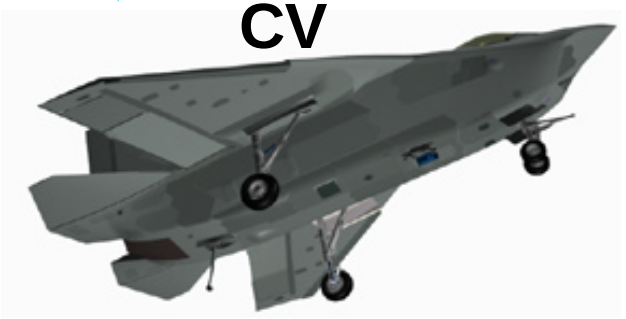
CTOL

- Internal 27mm Gun
- 9G Airframe

STOVL

- Direct Lift System
- Translating Cowl

CV



- Dual Nose Gear, Arresting Hook
- Higher Strength Gear / Airframe

LOCKHEED MARTIN X-35B (USMC / UK)

FLIGHT TEST:

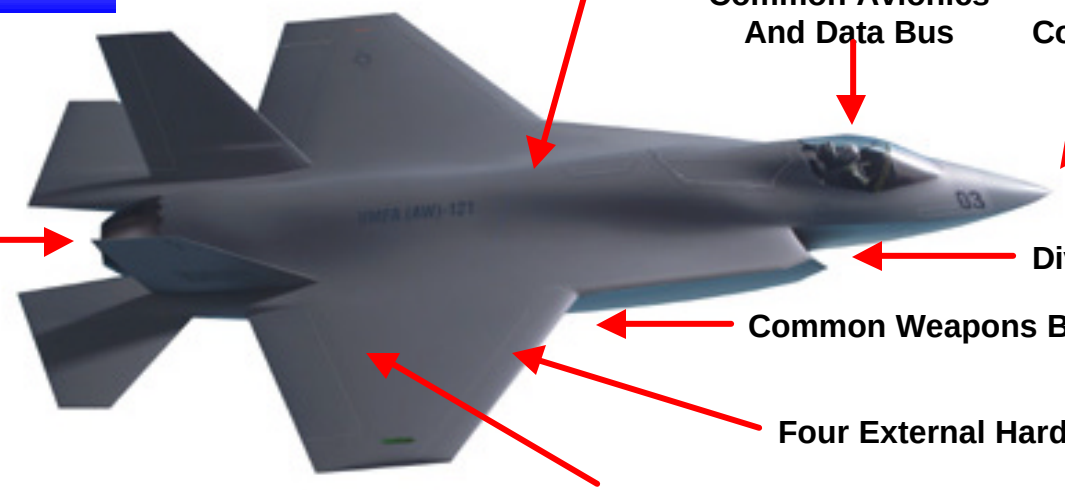
- First Flight Accomplished on 23 Jun 2001
- 38 Flights, 17.8 Hours
- STOVL Flight Test Completed 30 Jul 2001

SIGNIFICANT ACCOMPLISHMENTS:

- Performed Vertical Take-Off, Stabilized Hovers, and Vertical Landing at Palmdale
- 3 Pilots (BAE Systems, USMC, RAF) Have Hovered and Vertically Landed Aircraft
- Completed Short Takeoff, Supersonic and Vertical Landing in Single Flight
- Completed All Objectives

MULTI-SERVICE PREFERRED DESIGN CONCEPT

Common Characteristics



STOVL

- Lift Fan
- 3 Bearing Swivel Nozzle
- Missionized Gun

CTOL

- Lo Axi Nozzle
- Internal Gun

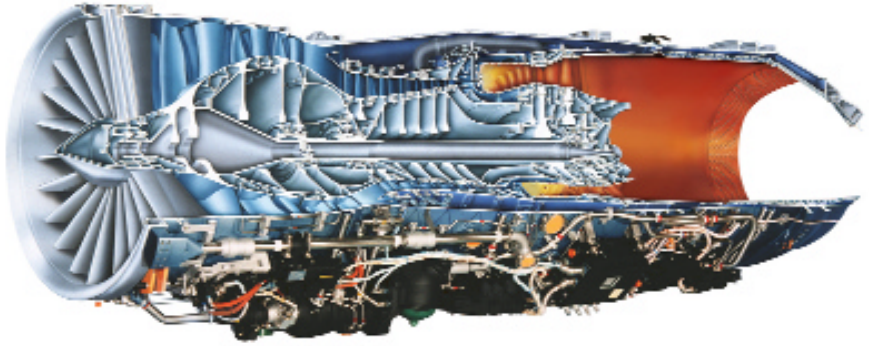
CV

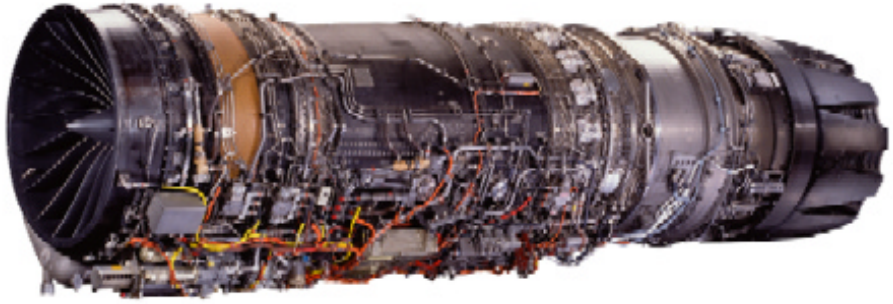
- Wing Tip Fold
- Higher Strength Gear
- Unique Control Surfaces
- Missionized Gun

JSF ENGINES

Primary

F119 Derivative



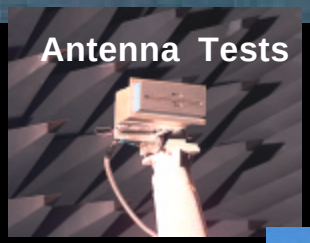


Interchangeable

F120 Derivative

JSF engines - - common core for aircraft variants, competition in production

JSF TECHNOLOGY DEMONSTRATIONS



PVI & Full Mission Simulations

Antenna Tests

Electro-Optical Systems

JSF'S CAPABILITIES AND CONOPS ARE LARGELY BASED ON DEMONSTRATED TECHNOLOGIES

TECHMAT SUCCESSES

- **Integrated Flight and Propulsion Controls**
  - CTOL Demo Successfully Completed Fall 2000
  - STOVL Demo Complete
- **Propulsion**
  - Completed Advanced Augmenter Tech Program
  - Risk Reduction Effort on Improved Hot Section Components
- **JSF Integrated Subsystem Technology (J/IST)**
  - First Flight 24 Sep 2000
- **Supportable Low Observable (LO)**
- **Avionics/Open System Architecture**
  - Contractor Flights Completed
- **Prognostics & Health Management**
  - Propulsion Seeded Fault Test
- **Paintless Aircraft**

JSF REPRESENTS A BALANCED SOLUTION

BALANCED PERFORMANCE

Lethality
- Precision Targeting- Adv/Wx
- Flexible payload
- Multi-function radar, FLIR
- Basing Flexibility
- Multi-role capability
- Combat radius

Survivability
- Low Observable
- Spherical EO/IR SA
- Advanced countermeasures
- Electronic Support
- Active MFA jamming

Supportability
- Reduced log footprint
- Highly reliable
- Maintainable
- PHM
- Sortie generation rate

Affordability

Combat Efficiency and Effectiveness

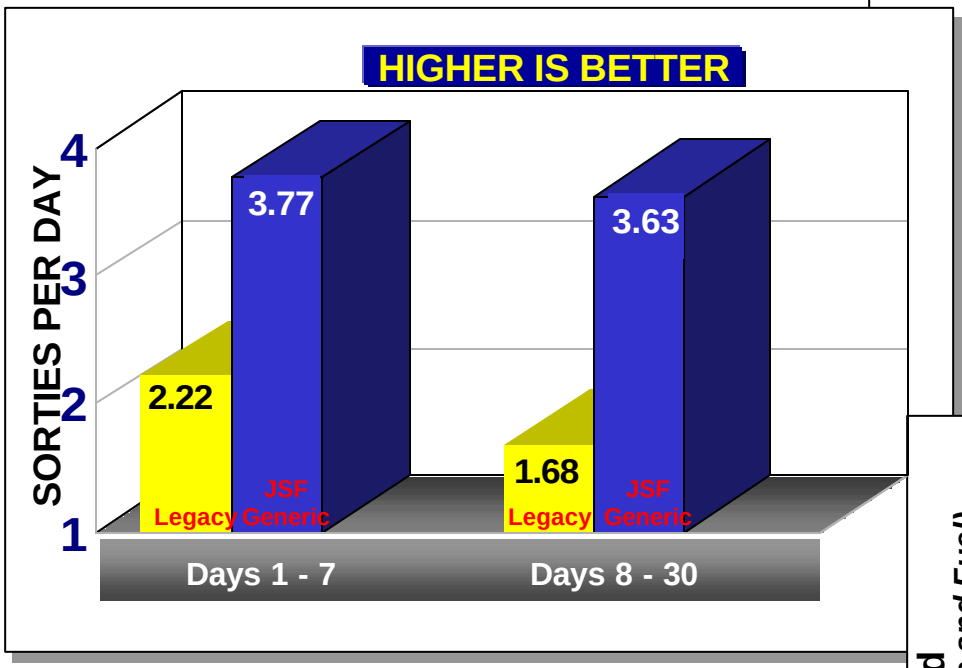
JSF is a Stealthy Strike Fighter Designed to Effectively and Affordably Counter Existing and Emerging Threats

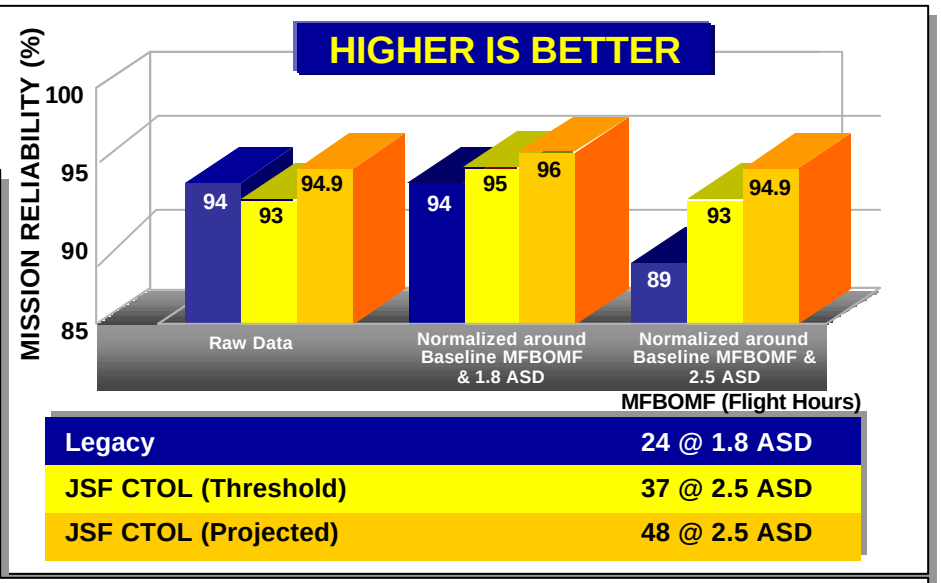
JSF KEY PERFORMANCE PARAMETERS (KPP)

- Interoperability
- RF Signature
- Combat Radius
- **Sortie Generation Rate**
- **Logistics Footprint**
- **Mission Reliability**
- CV Recovery
- STOVL Mission Performance

KEY PERFORMANCE METRICS

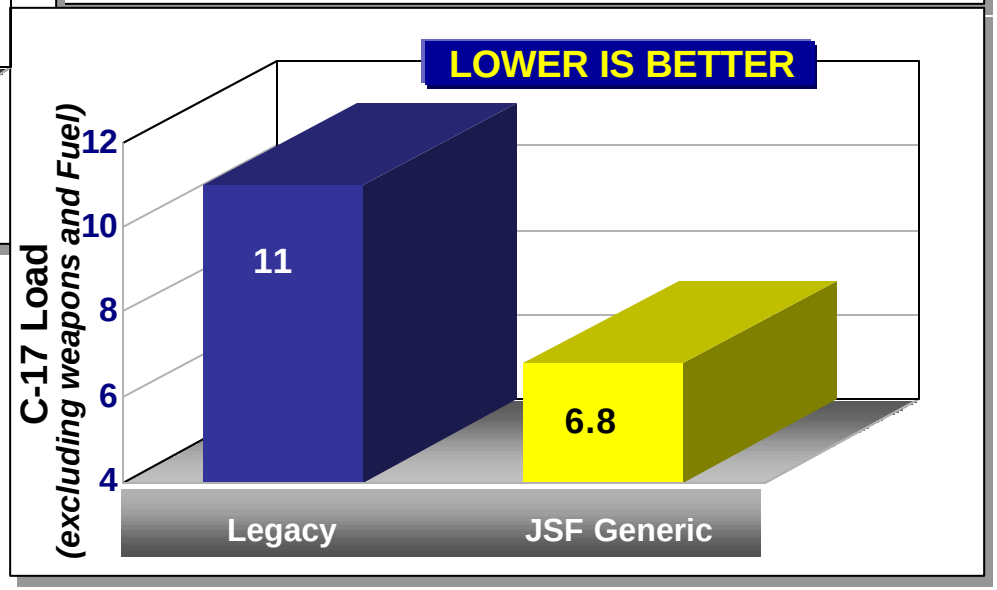
CAPABILITY IMPROVEMENTS



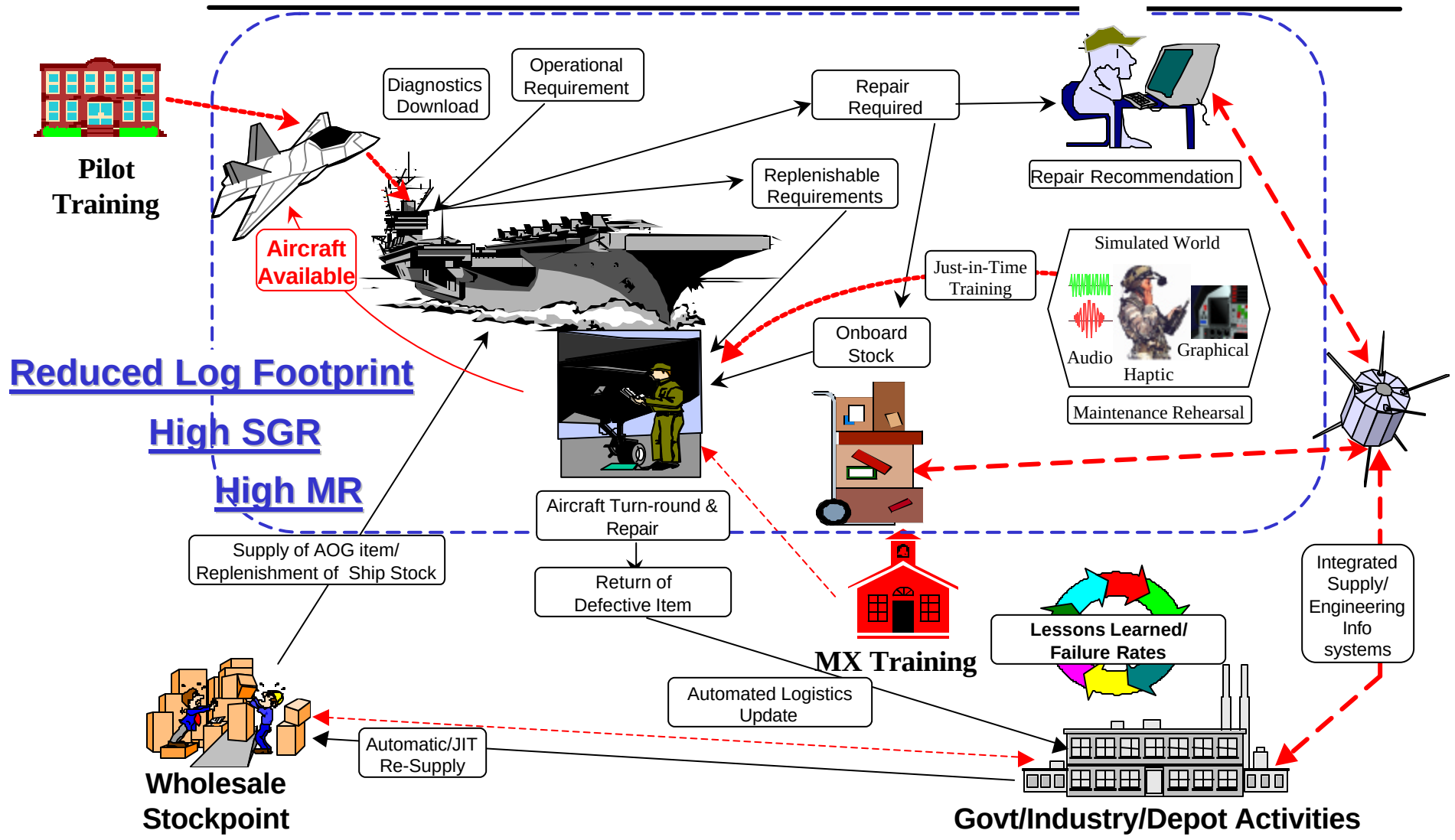


MFBOMF (Flight Hours)

Legacy	24 @ 1.8 ASD
JSF CTOL (Threshold)	37 @ 2.5 ASD
JSF CTOL (Projected)	48 @ 2.5 ASD



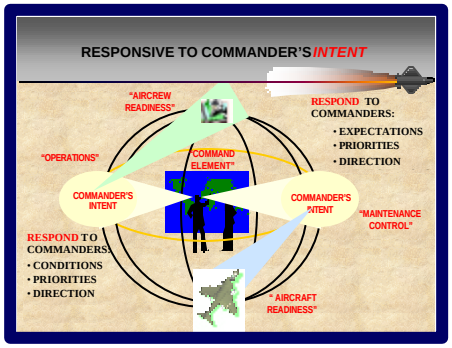
AUTONOMIC LOGISTICS CONCEPT



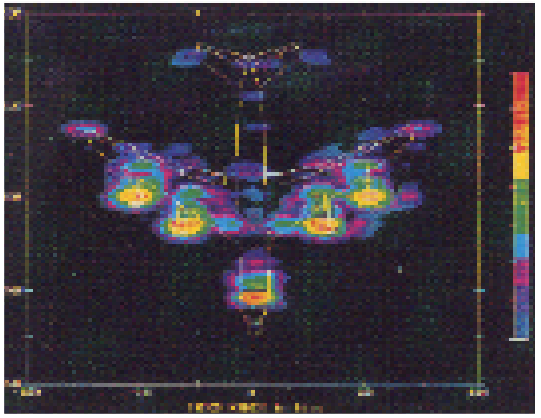
AUTONOMIC LOGISTICS TECHNOLOGIES

JSF Paintless Aircraft

CACE

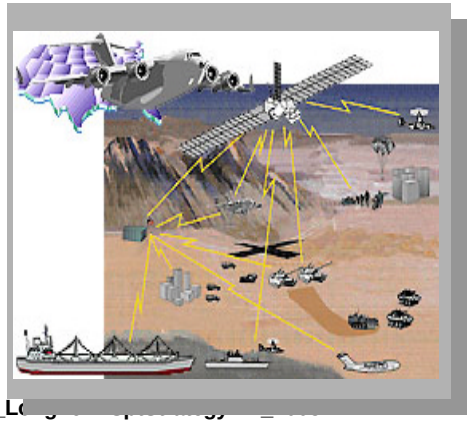


Supportable LO



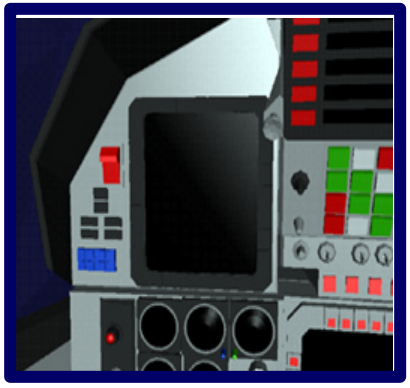
Prognostics & Health Management (PHM)

Joint Distributed information system (JDIS)



Oil Condition Monitor (OCM)

Training



Reliability & Maintainability

JOINT PAINTLESS AIRCRAFT PROJECT

Joint Paintless Aircraft - JPAP

UNCLASSIFIED

Flight Test- SD325

Completed 31 Aug 98

# Flights	268
Flight Hours	399
Hours Supersonic	>3.5
Hours in Rain	>1.5
Catapult Launches	62
Traps	62

Supportability Evaluation

Maintainability	Paint	Appliqué
Coating MMH/FH	0.98	<0.3
MTTR Repair	4.85	0.95
MTTR Cure (hr)	24 - 72	1

Next Generation Paintless Aircraft

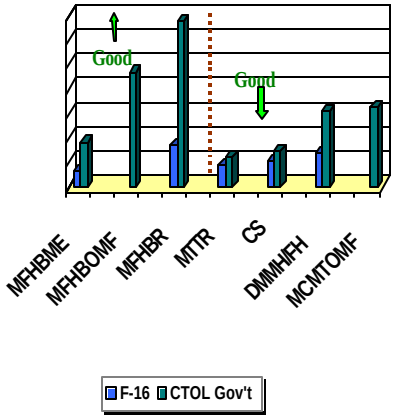
UNCLASSIFIED

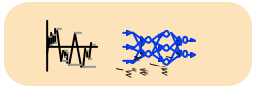
Supportability Flight Tests Completed

- Stripped JPAP Aircraft & ReCoated W/Gen 4 Film
- Accumulated Supportability Data on Gen 4 Applique
- Partial ReCoat with Gen 5 Applique
- Accumulated Supportability Data on Gen 5 Applique
- Results - Improved Supportability Demonstrated

HIGHLY RELIABLE AIRCRAFT USING PHM

Reliability Reconciliation Process



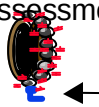


Advanced Life Algorithms & Component Health Assessment

Ingested Debris Monitoring System (IDMS)

Oil Condition Monitor (OCM)

Engine Distress Monitoring System (EDMS)

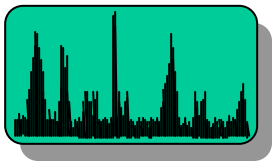


Electrostatic Bearing Monitor (EBM)

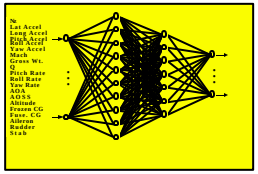
Electrostatic Oil Debris Monitor (EODM)

PHM Air Vehicle Area Manager

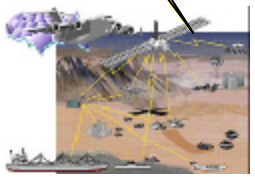
Avionics Area Reasoner
Electronics RF
Prognostics



Structural Area Reasoner

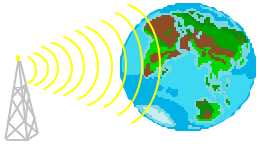


Other Area Reasoners
VMS
Subsystems
Signature



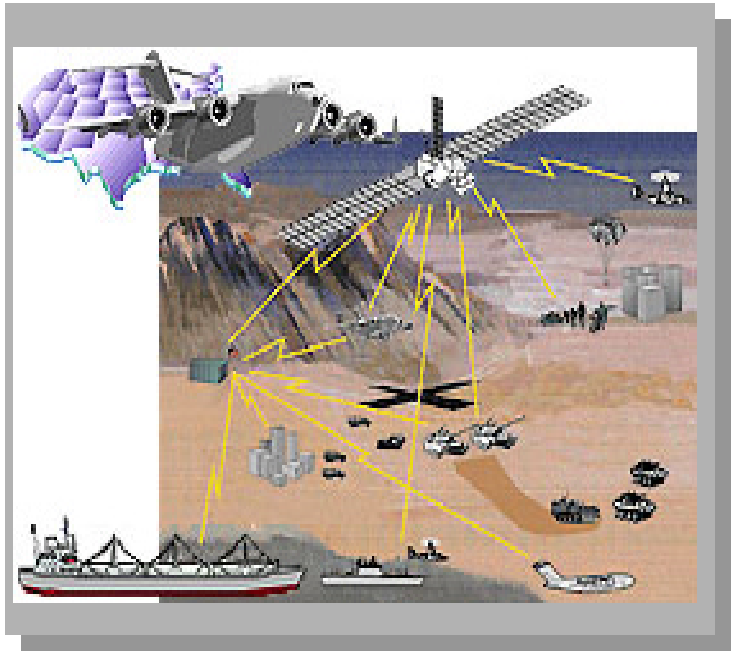
Proactive, Resource Multiplier

JOINT DISTRIBUTED INFORMATION SYSTEM (JDIS)



Communications

- Web enabled
- Radio Frequency
- Infrared/Ultraviolet
- SATCOM
- Databurst Mayday (Black Box Data)



Database Management

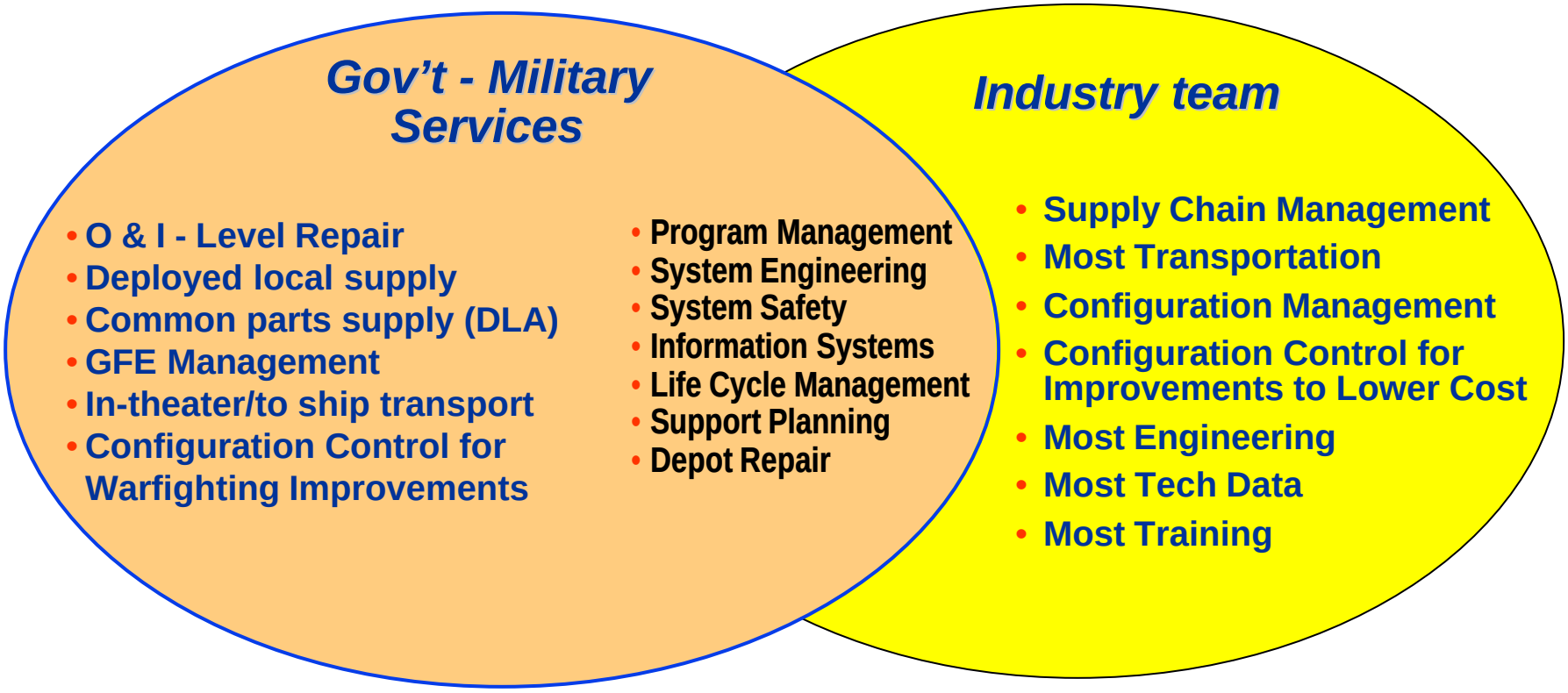
- Safety
- Mission Ops
- Configuration Management
- Status Updates
- Schedule Adjustments
- General Maintenance Actions
- Analyze Health of Aircraft
- Population
- Provide Interactive Electronic Technical Manual (IETM) Knowledge

Maintenance Management

- Web Interfaces
- Maintainer Identification
- Automatic Record of repairs
- Compatibility with legacy systems

Intelligent, Linked Logistics Infrastructure

JSF JOINT SERVICE / INDUSTRY TEAM: A PARTNERSHIP VISION

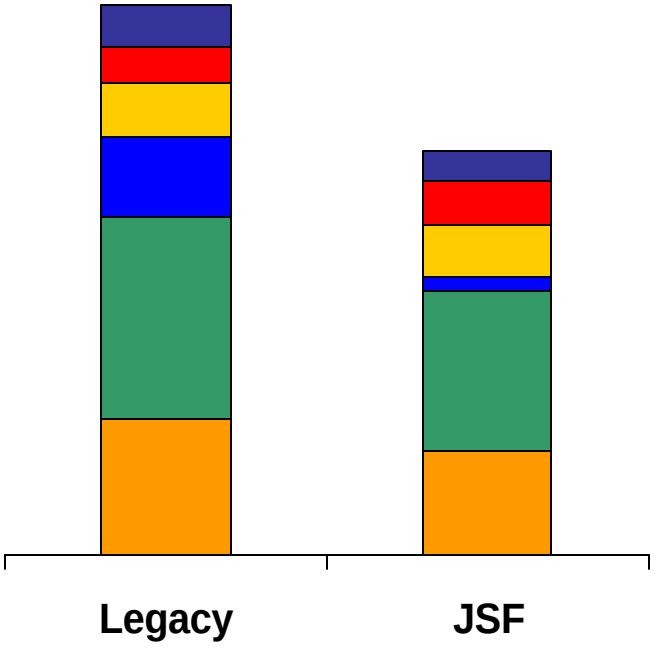


Leveraging the Strength of Government and Industry!

OPERATION & SUPPORT COST

SIGNIFICANT REDUCTIONS

Annual Cost per Squadron



Assumes a 12 Plane Squadron

Normalized to a common set of ground rules

Additional potential savings

Sustaining Support:
- ***Software Support Legacy Update.***
- ***Reliability Modification Incentivization***
- ***Less Tech Support***

Depot Maintenance and Unit Level Consumption:
Commercial Repair

Unit Personnel:
- ***Trade Consolidation***
- ***Utilization Rate Increase***

JSF IMPROVEMENTS IN RELIABILITY & MAINTAINABILITY ALLOW FOR A REDUCTION IN O&S COST

SUMMARY

- **Performance Based Logistics Approach**
  - Government/Contractor Partnering & Teaming
- **Departure From Business As Usual**
  - Joint for the Life of the Program, No Lead Service
  - Major Reliability, Maintainability & Supportability Improvements
- **Technology Demonstrated and Incorporated**
  - PHM, JDIS, SLO
  - Paintless
- **Road Ahead as We Enter EMD**
  - Develop and Test the Autonomic Logistics System
  - Joint Approach to Depot Source of Repair

Autonomic Logistics will deliver a fully integrated and tested logistics system for the Joint Strike Fighter

JOINT STRIKE FIGHTER

The Next Generation Strike Fighter